L 39650-66
ACC NR: AP6001514

figures.

SUB CODE: 09 / SUBM DATE: none / ORIG REF: 001

Card 3/3

BORON, Piotr; GRABIANSKA, Albina; MODZELEWSKI, Tadeusz

Attempted evaluation of a diagnostic intradermal test with the patient's own blood in differentiating infectious hepatitis. Przegl. epidem. 17 no.4:297-300 '63

1. Z Kliniki Chorob Zakaznych Akademii Medycznej w Bialymstoku. Kierownik: doc.dr.med. P.Boron.

BORON, Piotr; GIERASIMOW Maria; GRABIANKA, Albina

The behavior of hemolytic reactions in the course of trichinosis. Wiad. parazyt. 10 no.4:332-333 '64

1. Klinika Chorob Zakaznych Akademii Medycznej, Bialystok.

GRABIANSKA, Marta

New pharmacies in Warmia and Masuria. Farmacja Pol 19 no.11/12: 267-268 25 Je '63.

GRABIANSKA, Marta

Situation concerning the pharmaceutical staff in Olsztyn Voivodeship. Farmacja Pol 20 no. 5/6:223 25 Mr '64.

SERGIYENKO, I.N., prof.; GRABIAS, M.I.

Diagnosis and clinical aspects of systemic lupus erythematosus.
Uch. zap. Stavr. gos. med. inst. 12:324-325 '63.
(MIRA 17:9)

1. Kafedra gospital'noy terapii (zav. prof. I.N. Sergiyenko) Stavropol'skogo gosudarstvennogo meditsinskogo instituta.

GRABICS, Henrik

Surface evaporation factor and its calculation. Epuletgepeszet 12 no.5:165-170 0 '63.

GRABIEC, A., u.a.:

Das Metallspritzverfahren. - Warszawa: PWT. 1954. 196 S. 148 Zeichng. 40 Taf. (polinisch)

In diesem Buch werden die wahrend des Aufspritzens von Metallauftretenden Erscheinungen, die physikalisch-chemischen Eigenschaften der aufgespritzen Uberzuge und die Verfahren zur Durchfuhrung von Messungen einiger charakteristischer Werte beim Metallspritzverfahren besprochen, die Apparate und Vorichtungen besprokenfur das Metall spritzverfahren beschrieben sowie dieAnwendungdes Metallspritzverfahrens in der Industrie aufgezeigt. Es werden Auberdem die Grundlagen der Projektierung von solchen Spezialwerkstatten sowie Arbeitsschutz- Und Hygienevorscriften angegeben.

30: BERGAKADEMIE, Freiburg, East Germany, No. 10, Oct 55, pp 500. Unclassified fsg

GRABIEC S.

GRABIEC, S.; GUTTOWA, A.; MICHAJLOW, W.

New data on the ciliated envelope of the larval form of Triaenophorus nodulosus (Pall.) (Cestoda, Pseudophyllidea). Bul Ac Pol biol 10 no.10: 439-441 '62.

1. Institute of Parasitology, Polish Academy of Sciences, Warsaw. Presented by W. Michajlow.

JAKUTOWICZ, K.; GRABIEC, S.

"Organic elements appearing in minerals of the meteorites Orgueil and Ivuna (carbonaceous chondrites)" by Bartholomew Nagy, George Claus, Douglas J.Hennessy. Reviewed by K.Jakutowicz and S.Grabiec. Kosmos biol 11 no.5:533-540 '62.

GRABIEC, Stanislaw

Some biophysical aspects of catalysis. Kosmos biol 13 no. 4:329-337 '64.

GRABIEC, Stanislaw; BOGDANSKI, Kazimierz; ZENKTELER, Maciej; KAZUBSKI, Stanislaw L.; GUTTOWA, Alicja; LENKIEWICZ, Zofia; WOJTUSIAK, Roman J.; PINOWSKI, Jan

Review of books and publications. Kosmos biol 13 no. 4: 339-353 '64.

GRABIEC, Stanislaw; GUTTOWA, Alicja; JAKUTOWICZ, Konstancja; MICHAJLOW, Wlodzimierz.

Preliminray studies on the tranformations of high energy compounds in the coracidian, Triaenophorus nodulosus (Pall.) (Cestoda) and in the first intermediate hosts (Copepoda). Wiad. parazyt. 10 no.4:277-279 '64.

1. Zaklad Parazytologii Polskiej Akademii Nauk, Warszawa.

GRABIEC, S.J.; SYM, E.A.

Microcultures of Mycobacterium tuberculosis obtained on the synthetic medium DGK. Bull. State Inst. Marine Trop. M. Gdansk 4 no. 2:p. 163; Russian transl. p. 163-164; English transl. p. 164. 1952.
(CLML 22:5)

1. Of the State Institute of Marine and Tropical Medicine in Gdansk and of the National Institute of Tuberculosis in Warsaw.

GRABIEC, S.J.

Carbon metabolism in staphylococci. Bull. State Inst. Marine Trop. M. Gdansk 4 no.3:319-329 1952. (CLML 23:4)

1. Of the State Institute of Marine and Tropical Medicine, Gdansk.

GRABIEC, Stanislaw J.

Does the DNA matrix explain the biosynthesis of albumen? Kosmos biol 10 no.6:581-582 '61.

(Albumins)

GRABIEC, S; GUTTOWA, A; MICHAJLOW, W.

Structure of the ciliated envelope of the Coracidium of Diphyllobothrium latum (L) (Cestoda, Pseudophyllidae). Bul Ac Pol biol 11 no.6:293-294 '63.

1. Institute of Parasitology, Polish Academy of Sciences, Warsaw. Presented by W. Michajlow.

GRABIEC, Stanislaw; GUTTOWA, Alicja; MICHAJLOW, Wlodzimierz.

Effect of light stimulus on hatching of coracidia of Diphyllobothrium latum (L). Acta parasit Pol 11 no.14/18 229-238 '63.

1. Zaklad Parazytologii, Polska Akademia Nauk, Warszawa.

GRABIKOWSKI, Tadeusz, mgr ins.

Operational starting of the devices for adjusting alternatively railway cars of standard-gauge railway to wide-gauge railway tracks at the Przemysl railway station. Przegl techn 85 no.1:5 5 Ja '64.

GRABIKOWSKI, T., mgr inz.

Device for adjusting railway car axles to a different track gauge. Przegl mech 23 no. 2: 63 Ja '64.

GRABIKOWSKI, Tadeusz, mgr inz.

New efficiency improvements in the Krakow District Administration of State Railroads. Przegl techn 85 no.10:9 8 Mr '64.

KRYLOV, A.; GRABILIN, Ye.

Young hearts. Grazhd. av. 19 no.3:16-17 Mr '62. (MIRA 15:5)
(Aeronautics--Study and teaching)

GRABILIN, Yu.V., inzh.

Brief news. Shakht. stroi. no.4:30-31 '58. (MIRA 11:6)
(Mining engineering)

GRABILIN, Yu., inzh.

Brief news. Shakht. stroi. no.6:32 '58. (MIRA 11:6)
(Mining engineering)

GRABILIN, Yu.N., inzh.

Some problems of vertical mine shaft lining. Shakht.stroi. no.9:15-18 S '59. (MIRA 12:12)
(Shaft sinking) (Mine timbering)

11(7) SOV/118-59-9-12/20

AUTHOR: Grabilin Yu.N., Engineer

TITLE: High-Speed Shaft Sinking

PERIODICAL: Mekhanizatsiya i avtomatizatsiya proizvodstva, 1959, Nr. 9, pp 50-52 (USSR)

ABSTRACT: In April 1955, at the mine "Novo-Butovka" of the Trust "Krasnogvardeyskugol'" in Donbas, a shaft 5.5 m in diameter and 585 m deep was sunk. In the Table reproduced on page 50, pertinent data are given, comparing the work performed at "Novo-Butovka" with the other two jobs previously carried out at mines Nr. 5/6 imeni Kalinin and "Butovskaya Glubokaya". In sinking the "Novo-Butovka" shaft, the shaft sinking outfit KS-1m was used (Fig 1). The outfit ensures a fully mechanized method of removing rock and building a concrete safety wall; both of these processes pass concurrently and independently one from another. The outfit consists, on the whole, of the following compounds: A universal metal jacket 21.3 m high, rigidly connected with a double-layer shelf. The jacket and the shelf are suspended on 4 guiding and 2 central ropes operated by 4 winches placed on the surface (two 2LP-10 and two LP-35). The plunger consists of a movable

Card 1/3

spreading carriage and a 6-blade grasper, Type KS-2, with 0.65 m^3 capacity. The carriage is suspended independently from the jacket by means of a rope, operated by 45-ton lifting capacity winch placed on the surface; the carriage can move up and down inside the jacket. The movement of the grasper is performed by a pneumatic lifting device (telfer). The rock is removed from the shaft by self-tipping tubs of 3 m^3 capacity. Layout of concrete supplying outfit is given in Fig. 2. Concrete for reinforcing of shaft walls was delivered by two pipes 15 cm in diameter and distributed by a flexible hose along the shaft periphery. Introduction of the reinforcement was fully mechanized; on the strength of that the volume of labor was brought to a minimum and amounted to only 0.3 man-shift/m^3, which was 33 % less than the expenditure of labor when the "Butovskaya-Glubokaya" shaft where reinforcement was performed by armored-concrete tubing VNIIOMShS, and about 5 times less than when reinforcing the shaft nr 5/6 imeni Kalinin by bricks. In driving the "Novo-

High-Speed Shaft Sinking

Butovka" shaft, a brigade of workers headed by Hero of Socialist Labor N.N. Tikhonov was engaged. The brigade consisted 58-60 workmen, while when sinking the shaft Nr. 5/6 imeni Kalinin, 134 men were engaged, although both shafts were of the same diameter. The efficiency of each workman engaged in removing rock was 4.39 m^3 an hour, which is 2.5-4 times more than the best results formerly attained in high-speed shaft sinking. During the sinking 8800 m^3 of rock were removed from the shaft and 2650 m^3 of concrete laid. The planned rate of output was fulfilled 264 %. There are 1 graph, 1 table, 1 diagram and 1 photograph.

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GRABILIN, Yu.N., inzh.

Advantage of vertical shaft sinking with simultaneous lining.
Ugol' Ukr. 5 no.1:44-45 Ja '61. (MIRA 14:1)
(Shaft sinking)

DANCHICH, Vladimir Vasil'yevich; ALEKSEYEV, Vitaliy Borisovich; Grabilin, Yu.N., otv. red.; MESHCHANKINA, I.S., tekhn. red.

[Use of temporary supports during horizontal and inclined mining operations] Opyt primeneniia vremennoi krepi pri provedenii gorizontal'nykh i naklonnykh gornykh vyrabotok; obzor. Moskva, TSentr. in-t tekhn. informatsii ugol'noi promyshl. 1962. 21 p. (MIRA 16:11)
(Mine timbering)

SREBNYY, Mikhail Aleksandrovich; DOLIDZE, Konstantin Shalovich; BESEDA, Ivan Profir'yevich; POLYAKOV, Aleksey Ivanovich; GRABILIN, Yu.N., otv. red.

[World record for making a haulage drift (making 1,051 m. of drift in one month at Mine No.103 of the Chistiakov-antratsit Trust)] Mirovoi rekord provedeniia otkatochnogo shtreka (1951 m shtreka v mesiats na shakhte no.103 tresta Chistiakovantratsit). Moskva, Tsentr. in-t tekhn. in-t tekhn. informatsii ugol'noi promyshl., 1962. 22 p.
(MIRA 17:7)

SAMOYLOVSKIY, Mikhail Borisovich, prof.; KANAUKOV, I.N., kand. tekhn. nauk, retsenzent; GRABILIN, Yu.N., gornyy inzh., retsenzent; KRASOVSKIY, I.P., gornyy inzh., retsenzent; CHERNEGOVA, E.N., red. izd-va; MAKSIMOVA, V.V., tekhn. red.

[Supporting vertical mine shafts]Kreplenie vertikal'nykh stvolov shakht. Moskva, Gosgortekhizdat, 1962. 251 p. (MIRA 15:11)

(Mine timbering)

YEVSTROPOV, Nikolay Alekseyevich; KOLOBOV, Yuriy Vasil'yevich;
GRABILIN, Yu.N., otv. red.; PETRAKOVA, Ye.P., red.izd-va;
~~POLDYREVA~~, Z.A., tekhn. red.

[Some problems in short-delay blasting]Nekotorye voprosy korotkozamedlennogo vzryvaniia. Moskva, Gosgortekhizdat, 1962. 99 p.
(MIRA 16:3)

(Blasting)

AYRUNI, Arsen Tigranovich, kand. tekhn. nauk; ALEKSEYEV, Viktor Borisovich; BURSHTEYN, Mark Aleksandrovidh; GEYMAN, Leonid Mikhaylovich; GRABILIN, Yuriy Nikolayevich; KILIMOV, Sergey Leonidovich; SOSNOV, Vladimir Dmitriyevich; SENCHEVA, Valentina Ivanovna; SUYETIN, Georgiy Georgiyevich; FEYGIN, Lev Mikhaylovich; SHEVCHENKO, Vadim Dmitriyevich; KAZAKOV, B.Ye., otv. red. toma; TAYTS, T.L., red.; OSVAL'D, E.Ya., red. izd-va; MINSKER, L.I., tekhn. red.

[The coal industry of capitalist countries]Ugol'naia promyshlennost' kapitalisticheskikh stran. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po gornomu delu. Vol.2.[Technology, mechanization, and organization of development workings]Tekhnologiia, mekhanizatsiia i organizatsii rabot pri provedenii podgotovitel'nykh gornykh vyrabotok. Otv. red. toma: B.E.Kazakov, V.D.Sosnov, G.G.Suetin. 1962. 351 p. (MIRA 16:2)

1. Moscow. TSentral'nyy institut tekhnicheskoy informatsii ugol'noi promyshlennosti. 2. TSentral'nyy institut tekhnicheskoy informatsii ugol'noy promyshlennosti, Moscow (for Suyetin, Sencheva). 3. Gosudarstvennyy proyektnyy institut po avtomatizatsii ugol'noy promyshlennosti (for Feygin). 4. Gosudarstvennyy komitet Soveta Ministrov SSSR po avtomatizatsii i mashinostroyeniyu (for Sosnov). 5. Vsesoyuznyy tsentral'nyy proyektnyy institut po proyektirovaniyu shakhtnogo stroitel'stva kamennougol'noy promyshlennosti (for Burshteyn, Shevchenko). 6. Gosudarstvennoye nauchno-tekhnicheskoye izdatel'stvo po ugol'noy promyshlennosti (for Geyman).

(Continued on next card)

KOLOMIN, Gennadiy Andreyevich; ABRAMOV, Anatoliy Nikolayevich; BUSHUYEV, Anatoliy Petrovich; GRABILIN, Yu.N., otv.red.

[Making 901 m. of drift in one month with the PK-3 cutter-loader at the Polysaeva-2 Mine] 901 m shtreka v mesiats kombainom PK-3 na shakhte "Polysaevskaia-2." Moskva, TSentr. in-t informatsii i tekhniko-ekon. issledovanii ugol'noi promyshl., 1963. 11 p. (MIRA 17:7)

NASONOV, Leonid Nikolayevich, kand. tekhn. nauk; GRABILIN, Yu.N., gornyy inzh., red.; CHERNEGOVA, E.N., red.izd-va; MAKSIMOVA, V.V., tekhn. red.

[Supporting vertical mine shafts] Kreplenie vertikal'nykh stvolov shakht. Moskva, Gosgortekhizdat, 1963. 179 p. (MIRA 16:6)

(Mine timbering)

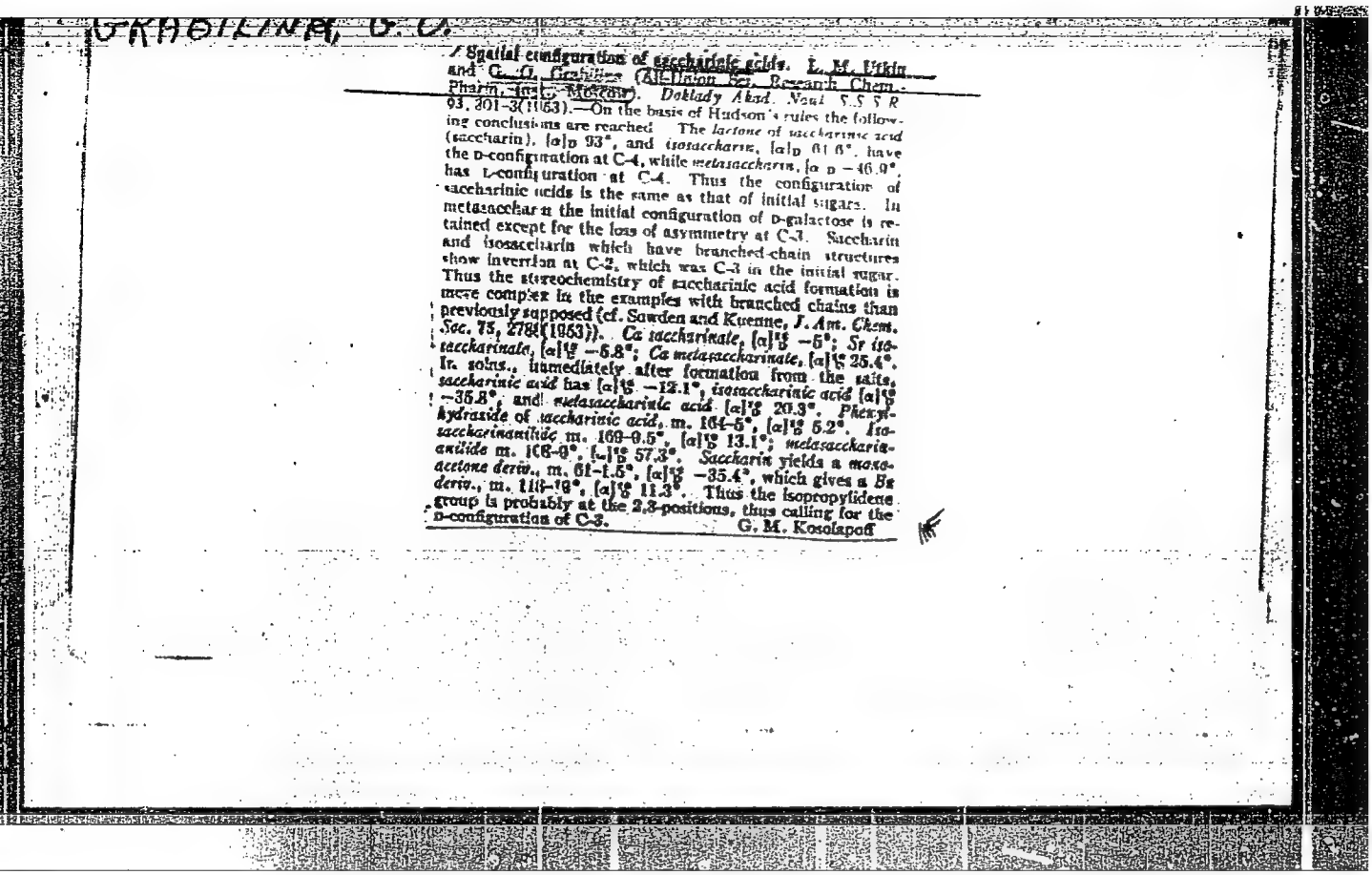
GRABILIN, Yu.N., inzh.

New wooden ring supports. Shakht. stroi. 7 no.2:30-31 F '63.
(MIRA 16:3)

(Mine timbering)

ALIMOV, Aleksey Petrovich; GOL'VINSKIY, Leonid Voynovich; KRUGLYAKOVA, Mariya Dmitriyevna; SKOROBOGATYY, G.I., retsenzent; YATSENKO, V.D., retsenzent; GRABILIN, Yu.N., otv. red.

[Mechanization of auxiliary processes in the building of coal mines] Mekhanizatsiia vspomogatel'nykh protsessov v shakhtnom stroitel'stve. Moskva, Nedra, 1965. 178 p. (MIRA 18:9)



KRASNAYA, U. G.

Spatial configuration of saccharinic acids. L. M. Utkin and G. G. Krasnaya (All-Union Sci. Research Chem.-Pharm. Inst., Moscow). *Doklady Akad. Nauk S.S.S.R.* 93, 301–3(1953).—On the basis of Hudson's rules the following conclusions are reached. The *lactone of saccharinic acid* (saccharin), $[\alpha]_D$ 93°, and *isosaccharin*, $[\alpha]_D$ 61.6°, have the D-configuration at C-4, while *metasaccharin*, $[\alpha]_D$ −46.9°, has L-configuration at C-4. Thus the configuration of saccharinic acids is the same as that of initial sugars. In metasaccharin the initial configuration of D-galactose is retained except for the loss of asymmetry at C-3. Saccharin and isosaccharin which have branched-chain structures show inversion at C-2, which was C-3 in the initial sugar. Thus the stereochemistry of saccharinic acid formation is more complex in the examples with branched chains than previously supposed (cf. Sowden and Kuenne, *J. Am. Chem. Soc.* 75, 2781(1953)). *Ca saccharinate*, $[\alpha]^{18}_{5}$ −5°; *Sr isosaccharinate*, $[\alpha]^{18}_{5}$ −5.8°; *Ca metasaccharinate*, $[\alpha]^{18}_{5}$ 25.4°. In solns., immediately after formation from the salts, *saccharinic acid* has $[\alpha]^{18}_{5}$ −12.1°, *isosaccharinic acid* $[\alpha]^{18}_{5}$ −35.8°, and *metasaccharinic acid* $[\alpha]^{18}_{5}$ 20.3°. *Phenylhydrazide of saccharinic acid*, m. 164–5°, $[\alpha]^{18}_{5}$ 5.2°. *Isosaccharinanilide* m. 169–9.5°, $[\alpha]^{18}_{5}$ 13.1°; *metasaccharinanilide* m. 168–9°, $[\alpha]^{18}_{5}$ 57.3°. *Saccharin* yields a *monoacetone deriv.*, m. 61–1.5°, $[\alpha]^{18}_{5}$ −35.4°, which gives a *Br deriv.*, m. 118–19°, $[\alpha]^{18}_{5}$ 11.3°. Thus the isopropylidene group is probably at the 2,3-positions, thus calling for the D-configuration of C-3.

G. M. Kosolapoff

GRABILINA, G. O. (Grad Stud)

Dissertation: "An Investigation of the Configuration and Some Reactions of Saccharinic Acid." Cand Chem Sci, All-Union Sci Res Chemicopharmaceutical Institute imeni Sergo Ordzhonikidze, 1 Jul 54. (Vechernyaya Moskva, Moscow 22 Jun 54)

SO: SUM 318, 23 Dec 1954

GRABILINA, G.O.; UTKIN, L.M.

Acetone derivatives of α-gluconic acid and its γ-lactone. Zhur. ob. khim. 30 no.9:3126-3128 S '60. (MIRA 13:9)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni S. Ordzhonikidze.
(Gluconic acid)

GRABIL'TSEV, A.V.

Diseases of the nervous system in patients with tuberculosis of the lungs and experience in their treatment with physical methods. Probl.tub. 38 no.7:49-53 '60. (MIRA 14:1)

1. Iz sanatoriya "Krasnyy mayak" (glavnyy vrach Ye.I. Kruzhalina) v Simenze.

(TUBERCULOSIS)

GRABIL'TSEV, A.V. (Simeiz)

Seawater bath therapy of associated diseases in tuberculosis.
Vrach.delo no.1:146-147 Ja '63. (MIRA 16:2)

1. Bal'neologicheskaya lechebnitsa pri sanatorii "Krasnyy mayak," Simeiz.
(SEAWATER--THERAPEUTIC USE) (TUBERCULOSIS)

GRABIL'TSEV, Yu.

Reliability and the length of service of household electrical appliances. Sov.torg. 36 no.12:22-24 D '62. (MIRA 16:1)
(Moscow--Household appliances, Electric--Quality control)

GRABIN, D., krupchatnik.

Conduits of galvanized steel. Muk.-elev.prom. 23 no.3: 26 Mr '57. (MLRA 10:5)

1. Odesskaya mel'nitsa No. 18.
(Flour mills--Apparatus and supplies)

GRABIN, V., prof., doktor tekhn.nauk general-polkovnik tekhnicheskikh voysk

Cannons and rates of fire. Voen.znan. 41 no.11:32-33 N '65. (MIRA 18:12)

GRABIN, V.F.

MAKARA, A.M.; GOTAL'SKIY, Yu.N.; GRABIN, V.F.

Investigation of the effect of the electric fusion welding process on the bead fusion and the width of the zone surrounding the bead in connection with the problem of steel alloy welding. Avtom. svar. 8 no.2:11-25 Mr-Ap '55. (MLRA 8:7)

1. Orden Trudovogo Krasnogo Znameni Institut elektrosvarki imeni Ye.O. Patona, Akademiya nauk USSR. (Steel alloys--Welding) (Electric welding)

AID P - 5250

Subject : USSR/Engineering

Card 1/2 Pub. 11 - 1/15

Authors : Makara, A. M., V. F. Grabin and I. V. Novikov (Electro-welding Institute im. Ye. O. Paton)

Title : Adjacent-to-seam cracks and mechanical properties of welded joints in resistance slag welding of medium-alloy steels.

Periodical : Avtom. svar., Vol 9, 4, 1-22, Ap 1956

Abstract : The authors analyze the cracks which occur in the area near seams of medium-alloy chrome-nickel-molybdenum steels, and the fissures which may appear near the line of fusion. Causes and methods of prevention are outlined and studied. Mechanical characteristics of the adjacent-to-seam areas and the metal of the seam-itself are ascertained. The triple-layer method of resistance slag welding was introduced. This method restores the toughness of metal in adjacent-to-seam areas without the

AID P - 5250

Avtom. svar., 4, 1-22, Ap 1956

Card 2/2 Pub. 11 - 1/15

need for heat-treatment of the specimen after welding. The method of double-layer hard-facing, used in conjunction with the triple-layer method, restores the original features of the adjacent-to-seam area without tempering after welding. Nine macro- and microstructure-photos, 6 tables and drawing; Five Russian references (1955-56).

Institution : As above

Submitted : No date

AID P - 5261

Subject : USSR/Engineering

Card 1/1 Pub. 11 - 12/15

Authors : Grabin, V. F. (Electrowelding Institute im. Paton) and I. B. Mlinov, (Stalingrad Machine-Building Plant)

Title : Resistance slag welding of connecting rods used in hydro-electric power installations.

Periodical : Avtom. svar., 14, 115-119, Ap 1956

Abstract : The authors describe the welding of connecting rods 2 1/2 to 3 m long and 125mm in diameter at the Stalingrad Machine-Building Plant for the Kuybyshev hydro-electric power station. One comprehensive table and 2 drawings.

Institutions: As above

Submitted : No date

AUTHORS: Grabin, V.F. and Gurevich, S.M. SOV-125-58-2-5/11

TITLE: Electronic-Microscopic Examination of Titanium Weld Joints (Elektronno-mikroskopicheskoye issledovaniye svarnykh shvov titana)

PERIODICAL: Avtomaticheskaya svarka, 1958, Nr 2, pp 37-41 (USSR)

ABSTRACT: An "UEM-100" electronic microscope was used to examine the structure of argon-arc welded joints in commercially pure "VTI" titanium of 2 - 3 mm thickness welded with tungsten and fusing titanium electrodes under "AN-Ti" flux. The structure of seams is shown in electronic micro-photographs, and information is presented on the effect of impurities (such as nitrogen, oxygen, hydrogen and carbon), on the fine structure of the seam metal, revealed with the aid of the electronic microscope. There are 5 microphotos and 5 references, 2 of which are Soviet, 1 French and 2 English.

Card 1/2

SOV-125-58-2-5/11

Electronic-Microscopic Examination of Titanium Weld Joints

ASSOCIATION: Institut elektrosvarki imeni Ye.O. Patona AN USSR (Institute of Electric Welding imeni Ye.O. Paton, AS UkrSSR)

SUBMITTED: December 3, 1957

1. Titanium--Welding

Card 2/2

SOV-125-58-8-6/16

AUTHORS: Grabin, V.F., Rabkin, D.M.

TITLE: Method of Metallographic Examination of Weld Joints in Aluminum (Metodika metallograficheskogo issledovaniya svarnykh shvov alyuminiya)

PERIODICAL: Avtomaticheskaya svarka, 1958, Nr 8, pp 37-40 (USSR)

ABSTRACT: Information is presented on technology of polishing prior to examination of macro- and microstructures in aluminum weld seams. Information includes recommendations for reagents of electrolytic polishing, composition of which is given in a table, as well as optimum parameters of the polishing process. There are 2 photos, 1 diagram, 1 table and 5 references, 2 of which are Soviet, 1 German, 1 English and 1 French.

ASSOCIATION: Institut elektrosvarki imeni Ye.O. Patona, AN UkrSSR (Institute of Electric Welding imeni Ye.O. Paton, AS UkrSSR)

SUBMITTED: February 27, 1958

1. Metallurgy 2. Welded joints--Inspection

Card 1/1

AUTHORS: Gurevich, S.M., and Grabin, V.F. SOV-125-58-9-5/14

TITLE: Metallographic Investigation of Weld Joints in Zirconium (Metallograficheskoye issledovaniye svarnykh shvov tsirkoniya)

PERIODICAL: Avtomaticheskaya svarka, 1958, Nr 9, pp 33-36 (USSR)

ABSTRACT: As existing methods of polishing weld joints in zirconium do not comply with given requirements, the Institute of Electric Welding developed a new method of preparing micro-sections of zirconium weld joints by machining, combined with subsequent electrolytic polishing. The new method produces smooth surfaces and a clear picture of the structure, for investigations on optical and electronic microscopes. There are 3 sets of microphotos and 7 references, 2 of which are Soviet and 5 English.

ASSOCIATION: Institut elektrosvarki imeni Ye.O. Patona AN USSR (Institute of Electric Welding imeni Ye.O. Paton, AS UkrSSR)

SUBMITTED: June 5, 1958

1. Zirconium--Welding 2. Welded joints--Applications
3. Welded joints--Structural analysis

Card 1/1

GRADIN, V.F.; GURKVICH, S.M.

Investigation of titanium welded joints by means of electron microscopy. Avtom. svar 11 no.2:37-41 F '58. (MIRA 11:4)

1. Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki im. Ye.O. Patona AN USSR.
(Titanium—Welding) (Electron microscopy)

GRABIN, V.F.; RAKKIN, D.M.

Method of metallographic examination of aluminum weld joints. (MIRA 11:10)
Avtom. svar. 11 no.8:37-40 Ag '58.

1.Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki im. Ye.O. Patona AN USSR.
(Aluminum--Welding) (Welding--Testing) (Metallography)

GUREVICH, S.M.; GRABIN, V.F.

Metallographic study of welded zirconium joints. Avtom.svar. 11 no.9: 33-36 S '58. (MIRA 11:11)

1. Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki imeni Ye.O. Patona AN USSR.
(Zirconium--Metallography) (Zirconium--Welding)

18 (2, 3, 5) SOV/125-59-11-4/22

AUTHORS: Grabin, V.F., Engineer, and Rabkin, D.M., Candidate of Technical Sciences

TITLE: Composition of Phases in Weld Metal when Welding Alloy AMg6

PERIODICAL: Avtomaticheskaya svarka, 1959, Nr 11, pp 26-28(USSR)

ABSTRACT: The main admixtures in the weld metal when welding alloy AMg6 are magnesium, silicon and iron. For research of phase composition in the weld, test pieces welded with argon arc non-fusible electrodes, both with a metal pre-heating up to 300°C and without it, were used. The method of preparation of microsections is similar to that described by A.A. Bochvar in his work "Metallography", published by the Metallurgizdat, 1956. The composition of phases in aluminum-magnesium alloy is given in Fig 1. In Fig 2, two phases, β and Mg_2Si, are seen. The prints were made in an electrolitic bath filled with 8% solution of nitric acid in ethyl alcohol by using 0.1-0.2 amp/cm^2 curr-

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Composition of Phases in Weld Metal when Welding Alloy AMg6

ent. In Fig 3, a photograph made by electronic microscope is given; the β phase with a comparatively even surface can be clearly seen. There are 4 graphs, 4 photographs and 8 references, 6 of which are Soviet, 1 English and 1 German.

ASSOCIATION: Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki imeni Ye.O. Patona AN USSR(Order of the Red Banner of Labor Institute of Electric Welding imeni Ye.O. Paton AS UkrSSR)

SUBMITTED: March 9, 1959

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SOV/125-12-2-5/14

18(5)
AUTHOR: Rabkin, D.M., and Grabin, V.F.

TITLE: The Microstructure of the Metal of a Joint when Welding Aluminum (Mikrostruktura metalla shva pri svarke alyuminiya)

PERIODICAL: Avtomaticheskaya svarka, 1959, Vol 12, Nr 2, pp 49-53 (USSR)

ABSTRACT: The article deals with the results of metallographic research into the phase composition of a joint when welding aluminum with varying iron and silicon content. The quantity of iron in aluminum may reach 1.1%, and of silicon 1.1%, but aluminum for welding does not contain more than 0.4% of either. No data are available on the structure of the metal of a joint when welding aluminum. Data on the structure of cast aluminum containing a small quantity of iron and silicon is also lacking. The article uses the terminology accepted by A.A.Bochvar (The Study of Metals - Metallovedeniye, Metallurgizdat, Moscow 1956). As a result of a reduction in the solubility of admixtures,

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The Microstructure of the Metal of a Joint when Welding Aluminum

further cooling forms little dispersed insertions of intermetallic joints and of individual elements which form independent phases of $FeAl_3$, Si and triple joints. During the rapid cooling characteristics of the formation of a real ingot, apart from a stable solution of aluminum, depending on the proportions of admixture and on cooling rates, the following phases may be found in the metal structure: $FeAl_3$, Si, α (Fe - Si - Al) and β (Fe - Si - Al). Spectral analysis data showed that admixtures are fairly evenly distributed along the axis of the joint and across its section. Deviations in individual values did not exceed ± 10%. The microstructure of joints containing 0.3 ÷ 0.38% Fe in the complete absence of silicon and with a low concentration of it is illustrated. The small dispersal of deposits of $FeAl_3$ is clearly visible. They are evenly distributed along the whole surface of the edges. With a 0.11% Silicon content individual insertions appear of a new and finer phase which apparently contains silicon. As the silicon content increases a triple combination, α (Fe - Si - Al),

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The Microstructure of the Metal of a Joint when Welding Aluminum

can be distinguished. The conclusion drawn by the article is that metallographic research into joints of aluminum with a varying iron and silicon content establishes the presence of the following phases in the structure: $FeAl_3$, a triple combination probably of the α (Fe - Si - Al) type, and silicon. There are 4 graphs, 1 table, 5 illustrations and 7 references, 4 of which are Soviet, 2 English and 1 German.

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SUBMITTED: November 24, 1958

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18(2), 25(1) SOV/125-12-4-5/18

AUTHORS: Gurevich, S.M., Candidate of Technical Sciences, and Grabin, V.P., Engineer

TITLE: Weld Ageing for Two-Phase Titanium-Alloy Alloyed With Aluminum and Vanadium

PERIODICAL: Avtomaticheskaya svarka, 1959, Vol 12, Nr 4, pp 36-46 (USSR)

ABSTRACT: The authors give an investigation of the structure and the mechanical characteristics of welds of a titanium-alloy which contains about 6% Al and 4% V. The investigation was made after hardening and the following ageing at different temperatures. In several cases by electronic-microscope investigation a brittle ω-phase was found in the metal of the weld. Maximum hardness, plasticity and viscosity can be reached by a short-time ageing at the temper, from 30 to 75 minutes. By rising the temperature of temper the ageing, which is necessary to reach the maximum hardness will be decreased. Maximum content of β-phase, which will be done by hardening, is about 10%. In the welds of the

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Weld Ageing for Two-Phase Titanium-Alloy, Alloyed With Aluminum and Vanadium

alloy type VT 6 the ω-phase has the character of an intermediate-phase, which in the first stage of dissotiation develops a meta-stable β-phase. At long-time ageing in the welds the ω-phase will practically be eliminated. The plasticity and viscosity will increase. There are 4 graphs, 4 tables, 12 photographs and 23 references, 4 of which are Soviet, 15 English and 4 German.

ASSOCIATION: Ordena trudovogo krasnogo znameni institut elektrosvarki im. Ye.O. Patona AN USSR (Institute of the Order of the Red Banner of Labor for Electric Welding imeni Ye.O. Paton, AS UkrSSR)

SUBMITTED: December 25, 1958

18(3,5,7)
AUTHOR: Grabin, V.F., Engineer

SOV/125-59-5-7/16

TITLE: Methods for Etching and Preparation of Carbon Films with Welds of Titanium and Aluminum

PERIODICAL: Avtomaticheskaya svarka, 1959, Vol 12, Nr 5 (74) pp 62-65 (USSR)

ABSTRACT: The article presents the comparative evaluation of the existing methods for etching titanium and aluminum alloys. For the electrolytic separation of carbon films, currents of small density and weak concentrations of the solutions are to be used for chemical separation. After the separation, the carbon films are first washed in water, then in 0.5% solution of fluoric acid and then again in water. After that they are put into a 50% mixture of isoamyl - and ethyl-alcohol. Then they are dried in the vapor of these alcohols. Now the films are ready to be used for investigation in electron microscopes. The shown method gives a good separation of the films and an accurate transfer of the fine structure of welds on titanium and aluminum. There are

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SOV/125-59-5-7/16

Method for Etching and Preparation of Carbon Films with Welds of Titanium and Aluminum

2 photographs, 1 table and 12 references, 9 of which are Soviet and 3 English

ASSOCIATION: Ordena trudovogo krasnogo znameni institut elektrosvarki imeniYe.O.Patona AN USSR (Order of the Red Banner of Labor Institute of Electric Welding imeni Ye.O. Paton AS UkrSSR

SUBMITTED: February 12, 1959

Card 2/2

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SOV/125-60-2-5/21

AUTHORS: Gurevich, S.M. and Grabin, V.F.

TITLE: The Heat-Affected Zone in the Arc Welding of Titanium Alloys

PERIODICAL: Avtomaticheskaya svarka, 1960, Nr 2, pp 51-61 (USSR)

ABSTRACT: The heat cycle in the heat-affected zone in the arc welding of titanium alloys is here studied, and the dependence of the structure and mechanical properties on the welding process and type of alloy is determined. Experimental data shows that titanium alloys with iron, chrome and manganese are more prone to cracks in the heat-affected zone than alloys with molybdenum, vanadium, and niobium. Data from literature on the subject (Soviet, English, German) is given. It is mentioned that alloys with a stable beta-phase [Ref. 11 and 12], seem highly promising for use in structures from which high performance is required. The experimental

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The Heat-Affected Zone in the Arc Welding of Titanium Alloys

techniques used are described. The following conclusions are drawn. Titanium alloys, as well as technical titanium, are greatly inclined to increase the grain size in the superheated section of the heat-affected zone. Alloys containing a large quantity of β-stabilizing elements differ from α-alloys and low-alloy $\alpha + \beta$ - alloys in that their grains in the heat-affected zone are smaller. As the metastable β-phase increases, the sensitivity of the structure of the heat-affected zone to the welding conditions increases, and the toughness of the zone drops. Alloys which are alloyed with β-stabilizing elements (which form with titanium intermetal compounds) are the most inclined to form cold cracks in the heat-affected zone. In such alloys, therefore, the permissible concentration of alloying elements is lower than for alloys containing elements which form with titanium a continuous line of solid solutions. There

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The Heat-Affected Zone in the Arc Welding of Titanium Alloys

are 3 tables, 6 graphs, 3 sets of photographs, and 16 references, of which 7 are Soviet, 7 English, and 2 German.

ASSOCIATION: Ordena Trudovogo Krasnogo Znameni Institut electrosvarki im. Ye. O. Patona AN USSR (Order of the Red Banner of Labor Institute of Electric Welding imeni Ye.O. Paton of the AS Ukr SSR).

SUBMITTED: October 8, 1959

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S/129/60/000/009/007/009
E193/E483

AUTHORS: Gurevich, S.M., Candidate of Technical Sciences and Grabin, V.F., Engineer

TITLE: The Omega Phase in Welded Seams of Alloy VT6

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1960, No.9, pp.29-38 + 1 plate

TEXT: The object of the investigation, described in the present paper, was to study the mechanical properties, structure and constitution of the welded seam in a two-phase titanium alloy subjected to ageing treatment, during which the formation of the brittle omega phase can take place as a result of the following series of transformations:

$$\beta \rightarrow \beta + \omega \rightarrow \beta + \omega + \alpha \rightarrow \beta + \alpha$$

The alloy chosen for this purpose was the hardenable VT6 alloy in the heat-treated condition, containing 6.3% Al, 3.8% V, 0.18% Fe, 0.09% Si, 0.087% O, 0.005% H, 0.04% N and 0.05% C. The experimental specimens consisted of butt-welded sheets 2.5 to 3 mm thick; welding was carried out under the cover of the AN-T1

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E193/E483

The Omega Phase in Welded Seams of Alloy VT6

flux with the aid of welding electrodes made of technical titanium VT1, alloy VT6 and a single-phase alloy VT5-1, the latter material containing only those alloying additions that stabilize the α-phase, i.e. 3.8% Al and 2.8% Sn. Specimens, cut from the welded seam (1) immediately after welding, (2) after welding and ageing at 200, 300 and 400°C for various times and (3) after welding, followed by quenching from the two-phase region (850 to 900°C) and ageing, were used for hardness measurements, impact, tensile and bending tests, metallographic examination (on both optical and electron microscopes) and X-ray analysis. The following conclusions were reached: 1) The brittle omega phase can be formed in the welded seam of the VT6 alloy when it is subjected to heat treatment consisting of quenching and ageing. The formation of the omega phase is accompanied by an increase in hardness and decrease in ductility and impact strength of the alloy. 2) The omega phase, found in the welded seams of the VT6 alloy, constitutes an intermediate product of the first stage of decomposition of the metastable β-phase. Maximum quantity of the omega phase was found in the seam whose composition was nearest to that of the

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The Omega Phase in Welded Seams of Alloy VT6

welded metal, and minimum in weld prepared with the aid of electrode made of technical titanium. 3) After a prolonged treatment at the ageing temperature, the omega phase, formed initially in the solution-treated two-phase welds, disappears as a result of which ductility and impact strength of the weld increase. 4) The structural changes taking place in welded seams of alloy VT6 during ageing cannot be revealed with the aid of the optical microscope and small quantities of the omega phase cannot be detected even by X-ray analysis. However, the growth of this phase in the welded seam, quenched from the single-phase region and aged for a short period, can be detected with the aid of the electron microscope. There are 5 figures and 19 references: 3 Soviet, 12 English, 3 German and 1 French.

ASSOCIATION: Institut elektrosvarki AN USSR imeni akad Ye.O.Patona (Institute of Electric Welding AS UkrSSR imeni Acad. Ye.O.Paton)

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MALEVSKIY, Yuzef Boleslavovich; GRABIN, Vladimir Fedorovich; DAROVSKIY, Georgiy Fedos'yevich; PARFESSA, Galina Ivanovna; ROSSOSHINSKIY, A.A., kand.tekhn.nauk, retsenzent; MAKAR, A.M., kand.tekhn.nauk, red.; RIKBERG, D.B., red.; GORNOSTAYPOL'SKAYA, M.S., tekhn.red.

[Atlas of the micro- and macrostructure of welded joints] Atlas makro- i mikrostruktur svarnykh soedinenii. Pod red. A.M.Makara. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1961. 118 p. (MIRA 15:2)
(Welding--Testing) (Metallography)

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S/125/61/000/002/003/013
A161/A133

AUTHORS: Vabkin, D. M., Yagupol'skaya, L. N., Nikitina, A. F., Grabin, V. F.

TITLE: Effect of heat treatment on the corrosion resistance of AMg6 alloy and its welds

PERIODICAL: Avtomaticheskaya svarka, no. 2, 1961, 40-47

TEXT: The AMr6 (AMg6) alloy is an extensively used alloy that is corrosion-proof in air but not so in sea water. It is used in shipbuilding, apart from many other applications. It has been known for a long time that Al-Mg alloys with above 5% Mg are prone to sea water corrosion after hardening and aging, and the AMg6 can contain as much as 6.5% Mg. The described tests were carried out because of contradictory data in literature on the effect of heat treatment on such alloy grades. Two studied AMg heats had the following composition: 1) (%) 6.2 Mg, 0.70 Mn, 0.25 Fe, 0.25 Si, 0.14 Ti; 2) 6.5 Mg, 0.59 Mn, 0.05 Fe, 0.06 Si, 0.10 Ti. The welds were produced with an automatic argon arc process, with tungsten electrodes and filler wire of AMg6. The corrosion test solution was water with 3% NaCl + 1% HCl; tests were carried out at 20°C, for 24 and 48 hours, and the test techniques corresponding to those described by P. Brenner and W. Roth

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Effect of heat treatment on the corrosion ...

[Ref. 12: Recent developments in corrosion-resistant Al-Mg alloys. J. Institute of Metals, 74, 159, 1947). The results show that the corrosion rate rose abruptly after annealing at 125 - 225°C, then dropped, increased slightly in the 300 - 400°C range and decreased again at 500°C. The article includes photomicrographs made with an electron microscope. It was evident that metal subjected to the effect of high temperature (above 500°C) did not corrode, and that a second phase of peculiar appearance segregated on the grain boundaries in a continuous grid. Judging by the data of other investigations it was the β' phase that is instable and is converted into the equilibrium β-phase at higher temperatures. The β' phase has a higher negative potential than the solid Mg solution in Al and the usual β, and besides the solid solution loses Mg at its formation. The considerable potential difference in an electrolyte causes rapid decomposition of the boundary grid and a separation of whole grains from the metal. Apart from this, the behavior of metal appears to depend somehow on the state of the grain boundaries themselves, as this was noticed by F. Erdmann-Jesnitzer [Ref. 15: Interkristalline Korrosion und Korngrenzenaufbau, "Werkstoffe und Korrosion", 9 N., 1, 7, 1958]. It is concluded that the alloy tends to intercrystalline corrosion after 10-hours at 125-225°C, and long heating in this range must be avoided. There are 5 figures, 2 tables and 15 references: 12 Soviet-bloc and 3 non-

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A161/A133

Effect of heat treatment on the corrosion ...

Soviet bloc. Two references to English-language publications read as follows: F. M. Reinhart, G. A. Ellinger, Corrosion resistance of aluminum alloys, Light Metal Age, 14, N. 5-6, 16, 1956; P. Brenner, W. Roth, Recent developments in corrosion-resistant Al-Mg alloys. J. Institute of Metals, 74, p. 159, 1947.

ASSOCIATION: Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki im. Ye. O. Patona AN USSR (Electric Welding Institute "Order of the Red Banner of Labor" AS UkrSSR)

SUBMITTED: June 15, 1960

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A161/A127

AUTHORS: Grabin, V. F., Gurevich, S. M., Rafalovskiy, V. A., Trefilov, V. I.

TITLE: Investigation of aging processes in welds on biphase titanium alloys. Instalment I - Aging of welds in the post-welding state

PERIODICAL: Avtomaticheskaya svarka, no. 4, 1961, 3 - 12

TEXT: The purpose of the described investigation was to compare aging processes in biphase titanium alloys with different additions of β-stabilizers. Welds were studied in the as-welded state, and after heat treatment. The three experiment alloys were the commercial BT6 (VT6) with 6.1% Al and 4.1% V, and two test alloys designated no. 1 and containing 2.5% Al, 9.7% V and 3.8% Mn, and no. 2 - with 6.34% Mn. The investigation methods were the following: metallographic, electron-microscopic, X-ray, dilatometric, measurement of electric resistance and hardness, and tests for mechanical properties. Collodium, carbon and silver-carbon prints were used for examination with the УЭМ-100 (UEM-100) electron microscope. The phase composition was determined roentgenographically with copper radiation and nickel filters. The differential vacuum dilatometer had been described formerly [Ref. 11: V. F. Grabin, V. G. Vasil'yev, V. A. Rafalovskiy, "Avtom. svarka",

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Investigation of aging processes in welds on...

no. 3, 1960]. The electric resistance was measured in a high-temperature vacuum unit. Heating for heat treatment and artificial aging was produced in evacuated quartz ampoules. Welded specimens were prepared by joining 3 to 6 mm thick sheets by butt welding with electrodes of the same metal as the base metal, by submerged arc with AH-T1 (AN-T1) flux. The article presents the first part of results - obtained with welds that were not heat-treated. Graphs and electron microscope photo-micrographs are included. The formation of the phase omega was observed in the no. 2 alloy only (Ti-Mn), directly after the welding. The test results confirmed previous conclusions concerning the stability of welds on VT6 alloy [Ref.14: S. M. Gurevich, V. F. Grabin, "Avtom. svarka", no. 4, 1959]. The article includes references to Soviet-bloc and non-Soviet-bloc publications in connection with data on embrittlement in titanium alloy welds. Conclusions: 1) The possibility of ω-phase formation in weld metal and the adjacent heat-affected zone in binary Ti-Mn alloys (no. 2) has been experimentally proven. The formation of this phase directly after welding causes embrittlement. 2) The ω-phase seen in the electron microscope has the shape of round or oblong segregations that are distributed non-uniformly. The segregations were, as a rule, observed inside grains. 3) The ω-phase was not found in welds that contained β-stabilizers (vanadium and manganese aggregate content as in the no. 1 alloy), and an α-stabilizer (aluminum). But

Investigation of aging processes in welds on...

weld metal alloyed with manganese alone was highly prone to aging accompanied with the formation of ω-phase. 4) Aging was most intensive in the 200 - 450°C temperature range. Long isothermic soaking (to 100 hours) did not eliminate brittleness, which is apparently caused by the α-phase segregation on grain boundaries as a result of the $\beta + \omega \rightarrow \beta + \alpha$ transformations. 5) Welds in the VT6 alloy in the post-welding state are sufficiently stable and do not embrittle in artificial aging in the 200 - 500°C range. Hence it is wrong to use high-temperature treatment for the VT6 alloy welds when the required strength is not above 100 kg/mm^2. Tempering for stress relief will be sufficient. There are 6 figures, 3 tables and 14 references: 4 Soviet-bloc and 10 non-Soviet-bloc. The references to the four most recent English-language publications read as follows: E. L. Harmon, I. Koozol, A. R. Troiano, Mechanical Properties Correlated with Transformation Characteristics of Titanium-Vanadium Alloys, "Trans. Amer. Soc. Metals", v. 50, 1958; A. I. Griest, I. R. Doing and P. D. Frost, Correlation of Transformation Behaviour with Mechanical Properties of Several Titanium-Base Alloys, "Trans. Met. Soc. Amer. Inst. Min.", "Metal Eng.", 215, 1959; R. W. Douglass, F. C. Holden, H. R. Ogden and R. T. Yaffee, Effect of Microstructure on the Mechanical Properties of Ti-V, Ti-Al-V Alloys, "Journal of Metals", v. 12, no. 1, 1960; A. I. Griest, A. P. Joung, A Study of Beta Embrittlement in High-Strength Titanium Alloys, "Battelle Mem. Institute", 1958.

Card 3/4

27032

S/125/61/000/004/001/013
A161/A127

Investigation of aging processes in welds on...

ASSOCIATION: Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki im. Ye. O. Patona AN USSR ("Order of the Red Banner of Labor" Electric Welding Institute im. Ye. O. Paton AS UkrSSR) (V. F. Grabin and S. M. Gurevich); Institut metallofiziki AN USSR (Institute of Physics of Metals AS UkrSSR) (V. A. Rafalovskiy and V. I. Trefilov)

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S/125/61/000/005/013/016
A161/A127

AUTHOR: Grabin, V. F.

TITLE: New reagent for the etching of titanium welds

PERIODICAL: Avtomaticheskaya svarka, no. 5,1961, 91

TEXT: The reagents used to reveal the microstructure of titanium alloys include hydrofluoric and nitric acid as major constituents. Aqueous solutions of hydrofluoric acid are the most aggressive titanium solvents, and their activity increases considerably in the presence of nitric acid. These reagents have a common drawback - the very intense etching process causes difficulties in the determination of the structure. Besides, hydrogen concentrates on the surface being etched, and this results in a saturation with hydrogen and the formation of titanium hydrides. A new reagent selected and tested at the Institut elektrosvarki im. Ye. O. Patona (Electric Welding Institute im. Ye. O. Paton) is free of the mentioned deficiencies. Its composition is the following: 200 cm^3 methyl alcohol, 30 - 35 g oxalic acid, 1.0 - 2.0 cm^3 hydrofluoric acid, 4 - 5 g ferrous nitrate. The concentration of hydrogen ions on the metal surface is reduced due to the low content of hydrofluoric acid, and saturation with hydrogen is eliminated. The

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New reagent for the etching of titanium welds

etching time is two to three times longer (10 - 15 sec) due to the presence of trivalent iron ions producing an inhibiting action, and the absence of nitric acid and water. The new reagent is suitable for etching monophase titanium alloys (α and β) as well as biphase ($\alpha + \beta$ alloys). The microstructure of the weld metal, base metal and transition zone is revealed clearly. The methyl alcohol may be replaced by water and the content of ferrous nitrate doubled for the determination of the macrostructure of welds produced by arc and electro-slag welding. The results are better when the solution is heated to 50 ÷ 60°C. The grain boundaries are then revealed clearly in electro-slag welds. [Abstracter's note: Essentially complete translation]

Card 2/2

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22937
S/125/61/000/006/001/010
D040/D112

AUTHORS: Grabin, V. F., Gurevich, S. M., Rafalovskiy, V. A., Trefilov, V. I.

TITLE: Investigation of ageing processes in biphase titanium alloy welds. II installment. - Ageing of heat treated welds

PERIODICAL: Avtomaticheskaya svarka, no. 6, 1961, 3-13

TEXT: Results of investigation of the structure and mechanical properties of titanium alloy welds in the initial state were presented by the authors in instalment I (Ref. 3: "Avtom.svarka", no. 4, 1961). The II instalment presents the results of investigations made after heat treatment consisting in heating specimens to 800-900°C, quenching in water, and subsequent ageing at 200-600°C in evacuated quartz ampoules. The studied alloys were commercial BT 6 (VT6)(Ti-Al-V system) and two experimental compositions - No. 1 (Ti-Al-V-Mn) and No. 2 (Ti-Mn). The reason for the investigation is the ever more extensive application of high-strength biphase titanium alloys for welded structures, and the embrittlement in welds. The chemical composition and properties of the three studied alloys were given in Ref. 3. The

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Investigation of ageing processes ...

ageing process was studied by measurements of hardness, electric resistance and thermal expansion, and with X-ray and electron microscope observations. The results are discussed with references to data of seventeen other works, Soviet and foreign. The minimum hardness was established in VT6 alloy welds with the lowest quantity of ' (10%) after quenching; in mixed and structure it reached 550-600 Hv. Maximum hardness was reached faster at a higher ageing temperature. In VT6 the maximum hardness depended only little on the quenching temperature, but in the No. 1 and 2 alloys this dependence was more pronounced. The formation of upon isothermic decomposition was accompanied by volume reduction of specimens and change of the sign of the temperature coefficient of electric resistance. After sufficiently long holding periods decomposed forming dispersed particles; this was accompanied by a reduction in hardness and an increase in the volume and plasticity of the specimen. Decomposition of above 400-450°C was characterized by C-curves similar to those of the pearlitic decomposition of supercooled austenite (Fig. 2), but the start of separation had not the characteristical C-shaped line, for some amount of → transformation took place even at very rapid heating (up to 3000°C/sec, in alloys with a -composition close to critical electronic concentration). The high-hardness stage

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Investigation of ageing processes ...

passed very rapidly when the ageing temperature was sufficiently high, thus hardness decreased during isothermic soaking at 600°C. No sufficient homogeneity was obtained by heating to 800°C for quenching, for this temperature is near the upper limit of the biphase ($\alpha + \beta$) range. At 900°C homogenation is already possible, and the β -phase becomes less alloyed and decomposes faster in ageing. Contrary to the opinion of some foreign authors, it had previously been concluded by Soviet authors that at a certain electronic concentration in β the $\beta \rightarrow \omega$ transformation is without diffusion, and that the reverse martensite-like transformation (also diffusionless) could not be suppressed even by heating at a rate of several thousand degrees per second. This cannot be compared with the "reverse" in Co-Al alloys. The initial transformation in alloys whose β -phase structure has a near-critical electronic concentration must be presented as shown by the dotted line in Fig. 5, and not as it is presented usually. In alloys with omega already present after quenching the initial $\beta \rightarrow \omega$ transformation line will be the same. As it is not possible to fix precisely the start of decomposition in the case of furnace heating, the specimens were heated by electric resistance in a high-speed dilatometer. They were heated for 1 - 1.5 sec, then soaked for 90 secs. The results show that no transformation took place in

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Investigation of ageing processes ...

VT6 alloy, i.e. the specimens' length decreased only slightly, but in the No. 1 and No. 2 alloys the transformation was sharp and without any incubation period. It is important from the practical point of view to know the boundaries of the temperature range where the ω phase exists. The obtained data indicate that for the VT6 it is 180-420°C, and for No. 1 and No. 2 - 180-440°C. Seen under an electron microscope, the ω particles were mostly round. The included photomicrographs show no ω in No. 1 alloy welds after quenching (Fig. 7, a) (hardness was H_V 300-320); the No. 2 had a slight quantity of ω and high hardness (H_V 400). After 1 hr ageing at 350°C both alloys had clear round ω -phase particles 300-500 Å in size. Elongated 500-800 Å long particles were more rare. It is possible that they formed later, when the particles were only slightly growing. Long ageing ends with full transformation into alpha. In general, the data show that the quenching temperature should not be above 900°C as this reduces the plasticity of weld metal both after quenching as well as after ageing. Brief ageing of preliminarily quenched specimens raised the ultimate strength to 130 kg/mm^2 and considerably decreased the plasticity. Long ageing improved the plasticity of weld metal and only slightly decreased the strength, i.e. to 120 kg/mm^2. Conclusions. 1) The decomposition process of the metastable β -phase

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Investigation of ageing processes ...

in hardened welds of VT6, No. 1 and No. 2 alloys has been investigated. The transformation kinetics of β in ageing of quenched welds in biphase titanium alloys is analogous with the β-decomposition in the weld metal and heat-affected zone after welding. The ageing process is faster in hardened welds than in welds not subjected to preliminary heat treatment. 2) Diagrams of metastable β-phase decomposition have been plotted for the No. 1 and 2 alloys, and the decomposition mechanism discussed. 3) The $\beta \longrightarrow \omega$ transformation rate upon ageing of weld metal depends on the temperature of the preceding quenching. Lowering the quenching temperature from 900 to 800°C speeds up the ageing process in the VT6 alloy. In the No. 1 and 2 alloys the effect is opposite. 4) VT6 alloy welds are less prone to ageing than welds of No. 1 and 2 alloys, both after welding and after quenching. 5) Omega particles forming in the weld metal upon ageing are round, seldom elongated. Their respective size is 300-500 Å and 500-800 Å. 6) Quenching and subsequent long ageing of VT6 welds give an ultimate strength of up to 120 kg/mm^2 and satisfactory plasticity. There are 7 figures, 1 table and 17 references: 7 Soviet-bloc and 10 non-Soviet bloc. The four latest references to English-language publications read as follows: F. R. Brotzen, E. L. Harman and A. R. Troiano, Decomposition of Beta Titanium, "Journal of Metals",

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Investigation of ageing processes ...

v.7, No. 2, 1955; F. R. Brotzen, E. L. Harmon, A. R. Troiano, Trans. AIME, v. 203, 1955; R. T. Jaffee, Prog. Metal Phys., 7, Revue, 1958; I. M. Silcock, An X-ray Examination of the Phase in TiV, TiMo and TiCr Alloys, "Acta Metallurgica", No.7, 6, 1958.

ASSOCIATION: Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki im. Ye. O. Patona AN USSR (Institute of Electric Welding "Order of the Red Banner of Labor" im. Ye. O. Paton AS UkrSSR) (V. F. Grabin, S. M. Gurevich); Institut metallofiziki AN USSR (Institute of Physics of Metals AS UkrSSR) (V. A. Rafalovskiy, V. I. Trefilov)

SUBMITTED: January 24, 1961

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S/032/61/027/002/024/026
B124/B201

AUTHORS: Grabin, V. F., Vasil'yev, V. G., and Rafalovskiy, V. A.

TITLE: Exchange of experience

PERIODICAL: Zavodskaya laboratoriya, v. 27, no. 2, 1961, 234-235

TEXT: The authors suggested the design of a vacuum differential dilatometer for studying conversion processes at temperatures of up to 1200°. This dilatometer, which is schematically shown in a figure, works on the following principle: The standard and the test sample are filled into the quartz tubes 1 and 2 which are sealed afterwards. The hooked quartz tube 3 is connected by fusion to tube 2 and houses a thermocouple 4 which allows measuring the temperature of the sample directly on the surface of the latter without interfering with the vacuum. All three quartz tubes are housed in another quartz tube 5 which is fastened to the basal plate 9 of the dilatometer by means of a vacuum sealing, consisting of screw nut 6, vacuum ring 7, and connecting piece 8. A special backrest 10 is provided between 7 and the turnbuckle barrel to prevent the quartz tube 5 from being damaged when screwing on 6. The quartz press heads 13 and 14 respond

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to any deformation in extension of either standard or sample and simultaneously transfer it to the slide bars 11 and 12. The latter are pressed onto the rollers 15 and 16 by means of coil springs 17. The slide bar 11 moves on the two rollers 15 (both having the same diameter), and thus changes its position with respect to block 18. The slide bar 12 changes its position both with respect to 18 and 11. In doing so, it moves along 16 to which reflector 19 is attached. The leads of the thermocouples outside the vacuum bell 20, and the basal plate are water cooled. The angle of rotation of reflector 19 is proportional to the displacement of 11 and 12 with respect to 18, i.e., it is proportional to the mutual displacement of standard and sample. The beam reflected from 19 is recorded by a scale or a photographic drum. A magnification of up to the 5,000-fold may be attained by changing the diameter of 16 and the distance between reflector and scale or photographic drum, respectively. A so-called "system of continuous addition", consisting of rollers and the evacuation of the dilatometer head, which is incorporated in the device, allows a direct recording of the differential curve. By means of the dilatometer described, the sample temperature can be measured with high accuracy, even at high temperatures, since decarbonization or oxidation of

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the sample are excluded. The dilatometer may be used for investigations at low and/or high temperatures. [Abstracter's note: This is a full translation]. There is 1 figure.

ASSOCIATION: Institut elektrosvarki Akademii nauk USSR (Institute of Electric Welding, Academy of Sciences UkrSSR). Institut metallofiziki Akademii nauk USSR (Institute of the Physics of Metals, Academy of Sciences UkrSSR)

S/125/62/000/002/002/010
D040/D113

AUTHORS: Gurevich, S.M.; Grabin, V.F.

TITLE: Heat treatment of welds of VT6 alloy

PERIODICAL: Avtomaticheskaya svarka, no.2, 1962, 11-19

TEXT: The effect of different heat treatments on welds of ВТ 6 (VT6) alloy of Ti-Al-V class were studied experimentally using 6 mm thick ВТ 6 sheets welded with electrode wire of the same alloy and an АН-Т1 (AN-T1) flux. Heat treatment conditions were found by which welds with an ultimate strength of 120 kg/mm^2, good plasticity and toughness were obtained. The chemical composition of the VT 6 alloy is (in %): 6.0 Al, 4.1 V, 0.06 C, 0.20 Fe, 0.10 Si, 0.035 N_2, 0.008 O_2, 0.008 H_2. The composition of the weld metal in welding with the AN-T1 flux was practically the same as that of the base metal. Heat treatment consisted in water quenching from 700-1000°C, quenching with subsequent aging at 400 and 500°C, and annealing. Photo-micrographs of metal structure, obtained using an electron microscope, are included. References are

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Heat treatment of welds of VT6 alloy S/125/62/000/002/002/010
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made to English- and French-language publications illustrating different opinions on the proper maximum heating temperature of VT6 type alloys. Conclusions: (1) Annealing at up to 800°C has practically no effect on the mechanical properties of welds of VT6 alloy, and the relief of the α' matrix phase disappears; (2) Quenching from temperatures corresponding to the two-phase state range results in a partial replacement of the α phase by the α' phase; this has no perceptible effect on the mechanical properties; the quenching temperature must not exceed 850-900°C; (3) Step-by-step heat treatment, in contrast to continuous cooling, does not materially change the mechanical properties of VT6 welds; (4) The optimum strengthening heat treatment process is as follows: quenching from 850-900° with subsequent aging at 500-550°C for about 10 hours. There are 9 figures, 4 tables and 13 references: 6 Soviet and 7 non-Soviet-bloc. The four most recent English-language references are: P.D.Frost, Background for Practical Heat Treatment of Various Titanium Alloy Types, "Journal of Metals", v.8, no.1, 1956; Making Titanium Pressure Vessels, "Metal Industry", v.92, no.3, 1958; H.D. Kessler and R.G.Sherman, Heat Treating Titanium-Base Alloy Products, U.S. Patent 2804409, "Titanium Abstract Bulletin",

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Heat treatment of welds of VT6 alloy

S/125/62/000/002/002/010
D040/D113

v.3, no.6, 1957; I.I.Rausch, F.A.Crossley and H.D. Kessler, Titanium-Rich Corner of the Ti-Al-V System, "Journal of Metals", v.8, no.2, Section 2, 1956.

ASSOCIATION: Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki im. Ye.O.Patona AN USSR (Electric Welding Institute "Order of the Red Banner of Labor" im. Ye.O.Paton,AS UkrSSR)

SUBMITTED: June 9, 1961

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GRABIN, V.F.

"Metallography of welded joints" by A.A.Rossoshinskii. Reviewed by V.F.Grabin. Avtom.svar. 15 no.4:91-92 Ap '62. (MIRA 15:3)
(Welding—Testing) (Rossoshinskii, A.A.)

ACCESSION NR: AP4002090 S/0125/63/000/012/0040/0048

AUTHOR: Grabin, V. F.; Didkovskiy, V. P.; Gurevich, S. M.; Gordonnaya, A. A.

TITLE: Nature of ductility drop in electroslag-welded VT6 alloy joints

SOURCE: Avtomat. svarka, no. 12, 1963, 40-48

TOPIC TAGS: VT6 titanium alloy welding, titanium alloy electroslag welding, VT6 alloy weld property, VT6 alloy weld structure, electroslag welding, ductility drop, brittleness, VT6 titanium alloy, titanium, titanium alloy, alloy welding, titanium alloy welding, weld brittleness, weld structure, weld ductility, weld property

ABSTRACT: The reasons for the decrease in ductility of welds performed by electroslag welding of VT6 titanium alloy have been investigated by determining changes in microstructure and microhardness and by local spectral analysis. It was concluded that the main reason is the 0.7-1.0% higher concentration of vanadium in the grain boundaries of the welded zone than in the weld; the increase in concentration was proved by using a mass spectrometer. The concentration was found to be related to the rate of cooling of the weld. At cooling rates not lower than 4.5 degrees/second, minimum concentration results. It is concluded that the concentration in the boundaries at temperatures below the melting point proceeds with maximum intensity at 1200-1250 C, which

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ACCESSION NR: AP4002090

corresponds to the temperature ranges at which the diffusion mobility of the vanadium atoms is relatively high. Orig. art. has: 9 figures and 4 tables.

ASSOCIATION: Institut elektrosvarki im. Ye. O. Patona AN SSSR (Electric Welding Institute)

SUBMITTED: 05Feb63 DATE ACQ: 03Jan64 ENCL: 00

SUB CODE: ML, MA NO REF SOV: 011 OTHER: 002

Card 2/2

MALEVSKIY, Yu.B.; GRABIN, V.F.; VASIL'YEV, V.G.; YAVORSKIY, Yu.D.

Alloys of copper with cobalt and silicon for the electrodes of resistance welding machines. Avtom. svar. 16 no.8:47-57 Ag '63. (MIRA 16:8)

1. Institut elektrosvarki imeni Ye.O. Patona AN UkrSSR.
(Electric welding--Equipment and supplies)
(Electrodes, Copper)

MALEVSKIY, Yuzef Boleslavovich; VASIL'YEV, Valentin Grigor'yevich; GRABIN, Vladimir Fedorovich; NERODENKO, M.M., inzh., red.; POGORETSKAYA, L.N., red.

[Equipment for the dilatometric study of transformations in welded joints] Ustanovki dlia dilatometricheskogo issledovaniia prevrashchenii v svarnykh soedineniiakh. Kiev, Naukova dumka, 1964. 35 p. (MIRA 17:11)

MALEVSKIY, Yuzef Boleslavovich; GRABIN, V.F., kand. tekhn.nauk, otv. red.; DIKIY, V.N., red.

[Electron microscopy in industry] Elektronnaia mikroskopiia v promyshlennosti. Kiev, Naukovadumka, 1964. 53 p. (MIRA 18:1)